Volunteer Lake Assessment Program Individual Lake Reports

PLEASANT LAKE, DEERFIELD, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	2,240	**Max. Depth (m):**	19.8	**Flushing Rate (yr^{1})**	0.4
Surface Area (Ac.):	493	**Mean Depth (m):**	7	**P Retention Coef:**	0.78
Shore Length (m):	7,200	**Volume (m^{3}):**	13,995,000	**Elevation (ft):**	578

TROPHIC CLASSIFICATION

Year	Trophic class
1982	OLIGOTROPHIC
1996	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

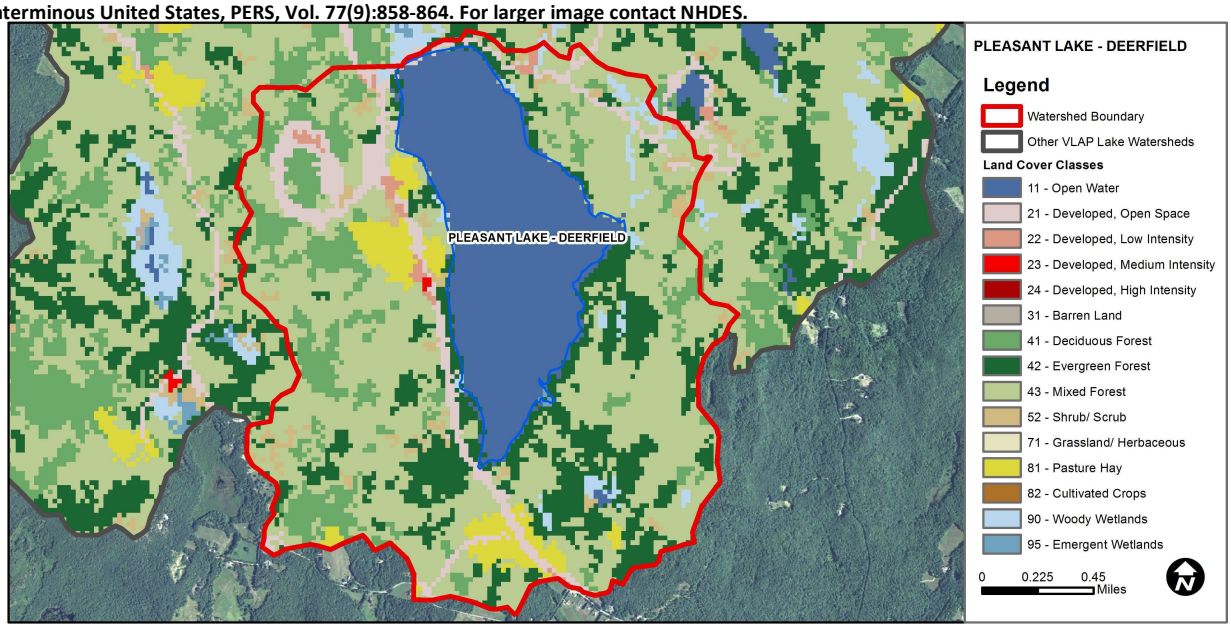
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (mg/L)	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

PLEASANT LAKE - VEASEY PARK BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	20.9	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	5.72	Deciduous Forest	9.74	Pasture Hay	3.79
Developed-Low Intensity	0.73	Evergreen Forest	14.84	Cultivated Crops	0
Developed-Medium Intensity	0.05	Mixed Forest	40.54	Woody Wetlands	1.49
Developed-High Intensity	0	Shrub-Scrub	1.86	Emergent Wetlands	0.06

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
PLEASANT LAKE, DEERFIELD, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were slightly elevated in June but had decreased to low levels in August and September. 2013 average levels increased slightly but were less than the state median. Historical trend analysis indicates relatively stable chlorophyll with high variability between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot conductivity and chloride were slightly greater than the state median. Conductivity was elevated in Branch Bk., Farrelly Bk. and Veasey Bk. Historical trend analysis indicates relatively stable epilimnetic conductivity with moderate variability between years.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus was low throughout the season; Metalimnetic phosphorus was slightly elevated in August and September; Hypolimnetic phosphorus increased as the summer progressed potentially due to phosphorus released from bottom sediments. Historical trend analysis indicates relatively stable epilimnetic phosphorus with high variability between years. Phosphorus levels were elevated in Clarks Bk., Loon Cove and Veasey Bk. on each sampling event and turbidity was also elevated in Clarks Bk. and Loon Cove. Significant storm events in June and/or August resulted in elevated phosphorus and turbidity in Branch Bk., Rt. 107 Inlet, Philbrick Bk., Veasey Bk., and Wilson Brook.
- **TRANSPARENCY:** Non-viewscope transparency decreased as the summer progressed, however viewscope transparency improved. Average transparency was well above the state standard and historical trend analysis indicates relatively stable transparency with moderate variability between years. Utilizing the viewscope helps remove factors that may interfere with Secchi disk viewing and may be a better measure of lake transparency.
- **TURBIDITY:** Metalimnetic turbidity was slightly elevated in August potentially due to algal growth. Branch Bk., Farrelly Bk., Loon Cove, Philbrick Bk., Veasey Bk., and Wilson Bk. experienced elevated turbidity after significant storm events in June and/or August. Clarks Bk. experienced elevated turbidity on each sampling event and laboratory notes indicate highly organic, colored water which likely contributed to the elevated phosphorus and turbidity.
- **PH:** Deep spot and tributary pH levels were lower than desirable range 6.5-8.0 units and potentially critical to aquatic life; however epilimnetic pH has increased since 2011. Historical data analysis indicates relatively stable epilimnetic pH with high variability between years.
- **DISSOLVED OXYGEN:** Dissolved oxygen levels had decreased slightly in the hypolimnion in June. Dissolved oxygen levels typically continue to decrease as the summer progresses and if levels decrease below 1.0 mg/L, phosphorus may be released from bottom sediments.
- **RECOMMENDED ACTIONS:** NH has experienced an increase in high volume and intensity storm events. Many tributaries experience elevated phosphorus and turbidity following these types of events. Identify areas impacted by stormwater runoff and implement best management practices to capture and infiltrate stormwater runoff before it reaches tributaries and the lake. Consult a certified erosion control specialist for assistance in identifying these areas and recommendations on stormwater controls. Continue working with the Town to update the watershed ordinance. Keep up the great work!

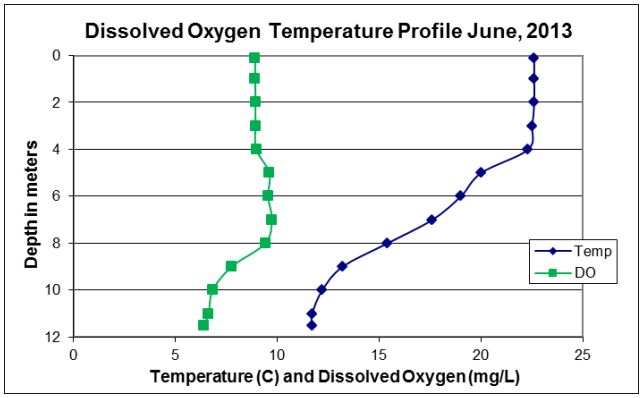


Table 1. 2013 Average Water Quality Data for PLEASANT LAKE

Station	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Ambrose Stream				36.8	5			0.15	4.95
Branch Brook				196.6	17			1.61	6.07
Clarks Brook				56.8	41			6.28	5.19
Dam Outlet In Stream				65.2	3			0.51	6.63
Epilimnion	2.73	3.80	10	64.9	4	5.55	6.63	0.72	6.50
Metalimnion				67.1	10			1.27	6.14
Hypolimnion				70.9	14			1.02	6.05
Farrelly Brook				206.0	10			1.01	5.95
Loon Cove				67.8	30			2.54	6.36
Philbrick Brook				18.7	24			1.08	5.12
Route 107 Inlet			4	37.2	13			0.57	5.91
Veasey Brook				300.0	22			4.02	6.46
Wilsons Brook				61.2	11			0.96	6.41

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data highly variable.
Conductivity	Stable	Trend not significant; data moderately variable.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.